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Urban growth and local taxes in less developed countries

Roy Bahl,
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and Johannes Linn

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PREFACE

This paper was first prepared for presentation at a conference on urbanization and national development at the East-West Center January 25–29, 1982. In its first version, it appeared as Occasional Paper No. 57 of the Metropolitan Studies Program of The Maxwell School of Syracuse University.

ABSTRACT The rapid growth of large cities in developing countries has aroused the interest of government planners and international donors, particularly with respect to how policy measures can be used to curb this growth. This paper takes another view: If rapid urbanization is inevitable, how might the accompanying growth in taxable capacity best be captured by local governments? The paper begins by describing a model that relates urban growth to fiscal need and taxable abilities. Attention is then turned to a description of the practice in the taxation of the three major urban tax bases: property taxation, automotive taxation, and sales and income taxes. The focus of the analysis is on the possibility of capturing increased revenue from these bases, given the legal, institutional, and economic constraints that inevitably face local governments in developing countries.

URBAN PUBLIC FINANCE in less developed countries (LDCs) has not been widely studied. Much of what has been done is case studies, designed to resolve specific tax policy problems. With the notable exception of Lady Ursula Hicks (1961, 1974) and, more recently, K.J. Davey (1983), few scholars have bothered with a conceptualization of the problem or with broad comparative analysis. The reasons for this neglect are not hard to find. First, the local government sector in LDCs is relatively small. Second, central government fiscal planners have long been preoccupied with the fiscal contributions and responses to stabilization, slow economic growth, and industrialization. In short, the real action simply has not been in the local government department of the ministry of finance or in the ministry of local government.

Things are changing. Cities in LDCs are growing at enormous rates, and urban areas are contributing both a heavy share of GNP and a new set of social problems (congestion, pollution, crime). As a result, there are few countries in which regional allocation considerations are not part of the long-term development plan. Many of these regional development plans are of fairly recent origin and most point toward the use of government policy to slow the growth of large cities; that is, they are decentralization programs. In other cases, the policies accept the inevitability of urban growth and attempt to strengthen the ability of cities to absorb in-migrants. These might be referred to as "accommodationist" policies. It is in this context that the role of local government in the development process—Lady Hicks's *Development from Below*—has been rediscovered.

This paper considers local tax policy as an instrument for accommodating the population and economic growth of cities in developing countries. First, we suggest the magnitude and nature of the urban growth that must be absorbed, the problems it has raised, and the policy setting in which local governments operate. Second, we offer the crudest of models to consider the kinds of effects that urban growth imposes on the local government fiscal system. Finally, we turn to a survey of the practice and problems with urban property, automotive, and business taxation, the three major local government tax sources in LDCs.

THE GROWTH OF CITIES

Many observers and policy analysts are alarmed at the current rate of urbanization in LDCs and at what seems likely for the rest of the century. It has been estimated that by the year 2000 the cities of LDCs will absorb 70 percent of projected population increases–1.3 billion people–most of them poor (Beier et al., 1975). This growth will more than double the 1975 population of cities in LDCs. The concerns raised about this growth are often more impressionistic than real and seem to be based on a notion that people in cities create special problems that would not have been so serious had migration not occurred. Four dimensions of urban growth in LDCs seem common to most urban "problems" discussions: migration, the size of cities, motorization, and poverty. These four dimensions offer some important opportunities, and constraints, for rethinking the role of urban tax policy.

Migration

Migration has accounted for about half of urban population growth in recent years, with a wide variation across countries and even among cities within countries (United Nations Commission on Human Settlements, 1979). There is good reason to expect this pattern to persist in the next several decades. Natural population growth in urban areas will continue to be quite high because of the young age of the population, and there is no sign of a slowing of the rate of migration to cities. The continuation of rapid growth of cities seems inevitable.

As for the public finance questions raised here, it is not simply the number, but also the characteristics of in-migrants that are important. Most surveys show that migrants from rural areas are, on average,

younger, better educated, more skilled, and more adaptable to urban life than are those who did not migrate (Goldstein and Goldstein, 1981). Even so, average rural-urban income disparities are quite large, and the new arrivals are poorer than the average resident. Moreover, the in-migrants contribute to an already acute shortage of jobs, housing, and public services.

City size

A second problem that concerns many government planners is the sheer size of cities. For example, Mexico City, whose population is now about 15 million, could have more than 30 million inhabitants by the year 2000 if growth rates of the 1970s continue, more than 20 million if there is no net in-migration. Most of the largest cities in the world will be in developing countries at the end of the century. Relatively little is known about how one manages urban areas of this size; for example, are there diseconomies of scale in the provision of urban services?

Motorization

Congestion and pollution underlie much of the concern about the problems related to the growth in cities. This in turn may be linked to the growth of slums and the growth in motorization. Automobile registration has grown much faster than population in developing countries (and is highly concentrated in cities) and has placed strains on urban governments for roadway development as well as for controlling congestion and pollution.

Poverty

Growing urban population is often treated as synonymous with growing urban poverty. In fact, the relationship between urban poverty and urban growth is not so straightforward. There are no good data on income distribution, unemployment rates are not well measured, and underemployment rates are pretty much unknown. About the only surrogate measure that can be used is the percentage of population living in slums, and even here there are serious problems with making intercity comparisons. Moreover, while 50 percent of urban population living in slums or substandard housing is not all that unusual, the relationship between the concentration of the poor and urban population growth is not at all clear and probably varies from urban area to urban area.

THE URBAN FISCAL PROBLEM IN LDCS

This rate and quality of population growth has led to a number of problems in the cities. Lady Hicks (1974) sees these as including

1. in-migration
2. congestion and pollution
3. administrative problems
4. shortage of finances
5. deficient levels of basic services
6. shortage of moderately priced housing
7. unemployment
8. deficient educational backgrounds.

She sees the first four of these as common to metropolitan areas everywhere, the last four as being unique to metropolises in LDCs.

Johannes Linn (1979:5) boils the same set of concerns down to two propositions:

> . . . that urban labor supply tends to expand more rapidly than urban labor demand, thus limiting urban employment opportunities. . . . and that the demand for urban services, including transportation, housing, and public services, expands more rapidly than their supply. . . .

Linn's second proposition is the popular notion of the urban fiscal problem as a major concern related to "excessive" city size. The question we raise is whether and how urban fiscal problems are exacerbated by city population growth. In fact, the public finance implications of urbanization in developing countries are much less clear than the casual observer might expect. That urbanization does pressure public expenditures upward is widely recognized. Less often discussed is the revenue side effect; that is, urban growth may well be contributing a substantial amount to the financial resources of urban governments. Local governments may be failing to draw on these resources, but the potential is there. In short, urban growth is more of a mixed blessing than most analysts have taken it to be.

Model

We might begin the process of modeling urban fiscal balance by assuming away the normative questions of the optimal level of central and local government taxation and the optimal local government share of total government resources. This analysis (using a model adapted from Bahl and Linn, forthcoming) is positive in that we are concerned only

with the actual and potential effects of urbanization on local government fiscal balance.

In order to examine the fiscal implications of urban growth in developing countries, we may postulate the following model: Define some subjective measure of expenditure "needs" for the ith service ($\hat{E}_i$), and compute total expenditure needs as

$$\sum_i \hat{E}_i = \sum_i \frac{\hat{E}_i}{\hat{Q}_i} \frac{\hat{Q}_i}{P} P = \sum_i \hat{e}_i \hat{q}_i P \tag{1}$$

where

$\hat{Q}_i$ = required quantity of service i
P = population
$\hat{e}_i$ = unit cost of required services
$\hat{q}_i$ = required quantity of services per capita.

Actual expenditures ($\hat{E}_i$) and quantities ($\hat{Q}_i$) are

$$\Sigma E_i = \Sigma \frac{E_i}{Q_i} \frac{Q_i}{P} P = \Sigma e_i q_i P \tag{2}$$

Local government revenues (R) are

$$R = \Sigma R_j + G = \Sigma \frac{R_j}{Y} \frac{Y}{P} \cdot P + G = \sum_j r_j y P + G \tag{3}$$

where

G = external grants
Y = income
y = per capita income
r = average effective tax rate for jth tax.

We may further expand the right side of (3) to

$$\Sigma r_j y P = \Sigma c t b y P + g P \tag{4}$$

where

c = collection rate
t = statutory tax rate
b = tax base as a percent of income
g = per capita external grant.

We may define the real fiscal deficit ($\hat{D}$) as

$$\hat{D} = \Sigma \hat{e}_i \hat{q}_i P - \Sigma c_j t_j b_j y P - g P = P[\sum_i \hat{e}_i \hat{q}_i - \sum_j c_j t_j b_j y - g] \tag{5}$$

Now the relevant question becomes how population growth affects each of these determinants of fiscal balance.

The growth of very large cities, however, involves far more than simple population increase. The market conditions sufficient for the growth of large cities include (1) economies of scale, (2) the ability to substitute capital and labor for land, and (3) strong interindustry linkages (Mills, 1982). To the extent that economies of scale extend to the public sector, e_i is reduced and $\hat{D}$ is dampened. The substitution of capital and labor for land raises productivity and factor prices (e_i), raises population density and $\hat{q}_i$, but also raises land values, hence increasing b. Strong interindustry linkages imply a growing formal sector, hence a more easily taxable base and an increase in b. The net impact of these revenue and expenditure effects on $\hat{D}$ is unclear.

In keeping with the revenue focus of this paper, we may associate "urbanization," or growth in city size, with characteristics meant to identify the quality of population growth. Following Mills's analysis, we may define increasing per capita income (Y) and an increasing formal sector (F) as two features of urban growth. Further, we may take the process of urban growth (U) to include not only increasing population (P), but also migration (M), motorization (A), and increasing concentrations of poverty (V); that is,

$$U = f(P,M,A,V,F,Y). \tag{6}$$

Using this simple framework, we might ask about the effects of various patterns of urban growth on urban government deficits.

Much of the literature has implicitly used such a model, for example, in suggesting or implying that migration pressures urban government budgets. The argument is usually that

$$\frac{\partial \hat{D}}{\partial M} = \frac{\partial \hat{D}}{\partial \hat{q}} \cdot \frac{\partial \hat{q}}{\partial M} > 0 \tag{7}$$

because both the quantity effect ($\partial \hat{D}/\partial \hat{q}$) and the migration effect ($\partial \hat{q}/\partial M$) will bid up expenditures. This, of course, assumes away the possibility that there will be or can be an offsetting revenue effect, for example, that b_i might increase with migration and motorization or that g might rise with in-migration. We would not suggest that the revenue effects of urbanization are fully offsetting of incremental costs, but they may be stronger than usually thought and ought to be considered. In that urbanization drives up property values, income

earned, the number and sales of local businesses, and the number of cars and trucks, it also increases the taxable capacity of the local government.

URBAN PROPERTY TAXES: PRACTICE AND PROBLEMS

In theory, increasing urbanization should increase revenues from the local property tax. As land runs short, the housing stock is expanded, and as commercial and industrial activities grow, property values also grow. Indeed, urban property values may well have grown as fast as urban public expenditure requirements, but property tax revenues clearly have not. The evidence suggests that urban property tax revenues have not kept pace with the growth of the base, largely because of the way the tax is administered in most developing countries. Assessment practices are inadequate, there is a great shortage of professional expertise in the valuation area, collection problems are severe, and taxpayer resistance to higher taxes on property is to be counted on. To understand better the failings of the property tax in capturing the revenue benefits of urban growth, it is necessary to turn to a brief statement of the existing practice in developing countries.

The practice

In principle we can describe three basic forms of property taxation: annual or rental value systems, capital value systems, and site or land value systems (for a more detailed comparison of practices, see Bahl, 1979). All are used in developing countries. In the first, the property tax rate is assessed against annual rental value; capital value systems use some proportion of the market value of property (both land and improvements) as the tax base; and site value systems are based on the market value of land, excluding improvements.

While this trichotomy in the property tax base is a useful point of departure, a classification formulated in the legal tax base greatly oversimplifies and does not necessarily identify "similar" systems. In practice, there are many more than three systems and these are differentiated by varying inclusions in the base, different rate structures, and perhaps most important of all, different assessment practices. In a sense, each country/city implants its own style—its cultural values and a unique set of political considerations—on its property tax system. As a result, it is not possible to point to any one of these basic systems as

clearly superior, though it is possible to identify specific practices that have favorable or unfavorable effects.

Annual value property tax systems, more or less resembling the British rates, are still used in most countries colonized by the United Kingdom. However, there are assessment problems (particularly with respect to industrial and owner-occupied residential property) that have prompted a switch to something resembling a capital value system. Indeed, perhaps the most significant feature of existing annual value systems is that all resort to some use of capital value assessment. There is little evidence of a trend toward annual value and away from capital value systems, and the capital value base does not resort heavily to assessment on a net rent basis.

There appears to be much more diversity among cities using capital value systems than among cities using annual value systems, with respect both to tax structure and the effectiveness of the practice. At least in intent, there are many common features in the use of capital value systems. The more important of these features, which also distinguish the capital from the annual value system (and from the capital value system in developing countries), are (a) a differential tax treatment of land and improvements; (b) an objective assessment practice for residential properties; and (c) a uniform assessment procedure for various types of land. Though there is much diversity in specific practices, there is a tendency for capital value systems to involve central and state government more heavily, especially in the assessment function.

In the last analysis, the capital value system is probably gaining in popularity because the concept of the sales value of property is more easily understandable and would appear to be more measurable. There lies the rub. Property value assessment and reassessment are highly technical matters and require a staff of substantial size and skill. The shortage of valuers in developing countries is acute, and governments have to make do with inadequately trained personnel, contrac out, or simply not reassess.

Site value property tax systems are attractive in theory since, unlike either annual value or capital value taxes, the site value levy would have an income effect but no allocation effect. With the amount of tax invariant with respect to the degree of development on the land, the tax would raise revenue and not alter the pattern of development that would otherwise have occurred. Capital value taxes, however,

levied on both land and the development thereon, tend to deter the degree of development.

Thus, site value taxation (SVT) has also been supported because it leads to more dense development than does capital value taxation (CVT) and therefore means lower government expenditures on certain urban infrastructure–streets, sewer and water lines, electric wiring, etc. An additional reason for preferring site value taxation has been the belief that, as compared with capital value taxation, the site value base will be more effective in energizing "sleepy" holders of vacant land, inducing them to develop or sell to others who will.[1]

Can we expect more from the property tax?

In a reflective essay, Carl Shoup has raised the question: "why so modest is the use made of the urban real estate tax in less developed countries . . . ? (Shoup, 1979:272). There are, as we have already noted, formidable administrative obstacles to property taxation. But Shoup does not emphasize them in answering his own question.

To explain why the potential of the tax is not drawn on, he thinks economists are at a disadvantage because sociology and political science and perhaps some anthropology must be called on to explain why this great reservoir of finance for urban progress is, with few exceptions, being tapped at a rate far below what to most of the outside observers seems quite practicable and desirable (Shoup, 1979:272–73).

In particular, Shoup finds a primary reason for the unsalutary

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1. Designating the value of land in the taxing jurisdiction as L and the value of improvements as I, and required revenue (the same under either tax) R, the rate of site value tax λ, and of capital value tax α, then:

   (1) Under the capital value tax: $R = \alpha(I + L)$
   (2) Under the capital value tax: $R = \lambda(L)$, and

$$\lambda = \frac{\alpha(I + L)}{L}.$$

Therefore the site value tax will always be levied at a higher rate than the capital value tax, the difference between them being determined by the ratio of improvements plus land to land.

If, for example, L is one-fourth of total value and I is three-fourths, then α=1 and λ=4 would raise the same revenue from their respective bases. On a vacant plot, however, the tax liability would be four times as large under SVT as under CVT. On an "average" property, i.e., one with L equal to one-fourth and I equal to three-fourths of total value, the tax liability would be the same under both bases, and for a property developed to a greater extent than average, the tax liability would be less under SVT than CVT.

neglect of the property tax base to lie "in the pattern of ownership of urban real estate in most developing countries" (Shoup, 1979:273). Not much commercial real estate is owned by the large domestic and foreign corporations that can be taxed at relatively little political cost. A heavy proportion is owned by important government officials and their families, and the substantial urban residential properties tend to have similarly influential owners. Lacking is a substantial proportion of middle-class housing. Thus, Shoup sees the tax base divided between "the politically nontaxable mansions and luxury apartments in high-rise structures, on the one hand, and the shanties of the poor that are not worth trying to tax, on the other."

Another reason for the "underdeveloped" property taxation in developing countries is the heavy reliance on the central government for the provision of public services such as education, police and fire protection, and roads. Shoup notes that the rich can afford to buy these services in the private market, and the relatively large middle-class demand that would be more effectively met by their finance in the public sector has not yet developed. If and when it does, real property taxation may be more heavily availed of.

Another factor noted by Shoup is the imperfect land-tenure and leasing arrangement, which makes valuation more difficult. And, finally, he points out the obstacles posed for property taxation by high and endemic rates of inflation. Property values are perpetually out of date, the dispersion of assessed around true values becomes more pronounced, and taxation, in effect, of unrealized gains poses still further difficulties to successful property taxation.

In the face of this formidable list of difficulties, is there any real prospect that property taxation will have a more appropriate role in urban finance in developing countries? Clearly this listing of obstacles suggests that it would be fruitless to look for a sharp improvement from a major reform or a particular device.

Some have urged, for example, that the formidable administrative obstacles and costs of property taxation could be circumvented by a scheme of self-assessment under which the taxpayer would set the taxable value for his property with the obligation to sell it for that price (or that price plus a premium) or pay a penalty based on that value if it should turn out to be too far below some minimum. But the success of such a scheme rests on a credible threat, and the factors cited from Shoup suggest the difficulty of mounting such a threat.

Moreover, even were self-assessment "practical," there is good reason to believe that it would exact a differential penalty from the relatively poor and the relatively poorly informed (Holland and Vaughn, 1969).

If there are no panaceas, what are the prospects, what can we reasonably expect and seek to accomplish?

For one thing, we can be more realistic. We should not exhort, encourage, or expect "substantial real estate tax in a country where tradition, custom, mores, political and power structures, and similar influences stand opposed to such a levy. What is badly needed is to know how to improve and evaluate the tax in those urban areas where it has taken firm root and could be, perhaps, transformed into a powerful engine of urban development" (Shoup, 1979:282).

For another, we should remind ourselves that change in urban public finance, as in so much else of human affairs, consists of slow, small, and uneven adjustments "such as the creation of special districts for capital cities with special expenditure responsibilities and revenue authority (Bogotá and Seoul); enlargement of metropolitan jurisdictions by annexation of adjacent municipalities (Bogotá); gradual development of new revenue sources (betterment levies in Colombian cities, land readjustment schemes in the Republic of Korea, and vehicle taxation in Jakarta); minor reassignments of expenditure functions (Kenya and Zambia). . . . " (Linn, 1980b).

Finally, we should encourage simplification of property tax design and objectives. Casual observation of the structure of property taxes in developing countries suggests a major difference from the practice in the United States. The cities in developing countries tend to use property taxation to induce allocative effects, that is, to discourage land speculation, promote the decentralization of metropolitan population, encourage housing maintenance and urban renewal, encourage higher buildings, and encourage home ownership. These features have been built into property tax systems in a variety of ways, including marginal adjustments in the property tax rate structure and assessment practices and through the institution of specific property tax coercive measures.

But these are triumphs in principle that do not get translated into practice. The special features are rarely implemented. They stand as a statement of intention, not accomplishment. And they may well do more harm than good because they suggest "we are doing something" and therefore tend to forestall more constructive efforts.

There simply is no hard evidence to suggest that these efforts to induce allocative effects actually work. Yet the practice in LDCs suggests that decision makers in many developing countries believe that such an effect can be induced. In any case, there is need to evaluate these benefits against revenue and equity costs and to rethink the use of such adjustments in terms of whether offsetting or reinforcing effects exist elsewhere in the property tax structure. One cannot achieve too many objectives with the same tax treatment; and one can hamper the achievement of a single primary objective by surrounding it with gingerbread.

We turn next to a promising new local government tax base that illustrates the strong relationship between revenue and allocation effects.

AUTOMOTIVE TAXATION

Motor vehicle ownership and use represent an excellent, but neglected, tax base for urban governments in LDCs (see also Linn, 1980a). The automobile population growth is more rapid than the city population growth in many cities, automobile ownership and use are easily taxable, and such taxes are likely to fall on persons with higher incomes. On the negative side, the growing automobile population increases urban government revenue needs by increasing expenditure requirements associated with road use and imposing considerable external costs of congestion and pollution on the urban environment. Much more attention has been focused on these costs than on the fiscal instruments that urban governments might develop to utilize this important revenue base and to control the high costs of urban congestion. A major difference between automotive taxes and all other local government taxes should be noted at the outset. This is the one case where efficiency objectives are as important as revenue-raising objectives, a factor that leads policy analysts to worry at some length about tax policy effects on road use and automobile ownership. Fortunately, automotive taxation in urban areas provides one of the rare examples where the benefit and ability-to-pay principles of tax policy converge.

The data in Table 1 show the degree to which the growth in the number of registered automobiles has exceeded that of population, for a sample of LDC cities, and suggests that the overwhelming proportion of the total urban motor vehicle fleet is made up of automobiles. Furthermore, comparing automobiles and populations in urban

TABLE 1. Rates of growth of population and automobiles for selected LDC cities

City	Rate of growth of population, 1960–70	Rate of growth of automobiles, 1960–70
Calcutta	2.2	7.2
Bombay	3.7	8.2
Madras	4.5	5.8
Seoul	8.5	22.0
Jakarta	5.3	8.8
Hong Kong	2.9	7.1
Bangkok	6.2	12.0
Singapore	2.6	6.7
Kuala Lumpur	6.5	11.3
Mexico City	5.8	10.5
Caracas	5.4	8.3
San Jose	5.4	10.9
Istanbul	6.0	12.2
Lagos	7.9	15.5
Tunis	2.5	6.0
Beirut	2.9	9.1

SOURCE: World Bank (1975: Annex 2).

areas with national totals shows that car ownership is heavily concentrated in the largest cities of developing countries (see also Smith, 1974:329–88). For example, in 1970, Bangkok had 8 percent of the national population and 83 percent of the nation's cars. Comparable figures are 7 and 57 percent for Seoul, 15 and 65 percent for Tunis, but 17 and 16 percent for Paris. These trends of growth and concentration are likely to persist with continued expansion of urban populations and income increases. This pretty much makes the case for automobiles or automobile use as a viable tax base.

Associated with the rise in the urban motor vehicle fleet is the increase in investment and maintenance requirements for street infrastructure and traffic management. That more cars will increase the pressure for more road and street expenditures is only half the story. The unit costs of these services are also likely to rise with increasing congestion and land prices in central urban areas and with increases in the relative price of materials (e.g., asphalt, concrete).

Besides these two reasons for taxing motor vehicles—the base is

there and increased numbers of cars generate revenue needs—there are the strong efficiency arguments for controlling the use of motor vehicles in urban areas. Traffic congestion and air and noise pollution are as bad, or worse, in many of the cities of developing countries as in the industrialized nations. And while it may be argued that higher congestion and pollution levels are likely to be more acceptable in the LDC cities than in the cities of developed countries, there can be little doubt but that the actual levels of congestion and pollution observed in most of the large LDC cities are far beyond optimal levels. Perhaps more important, things are likely to get worse in the years ahead.

This presents a quandary. If local governments are successful in using automotive taxes to reduce congestion and pollution, they will dampen the revenue productivity and elasticity of the tax base. On the other hand, there are considerable benefits to reducing congestion and pollution. Some of these benefits, reduced street and traffic related expenditures, accrue to the local governments. Other benefits, time savings and healthier air, accrue to the private sector rather than to the local government. Therefore, the decision to tax so as to selectively discourage road use rather than to maximize revenue yield from the automotive base may reflect the local government's view that controlling congestion and pollution is a higher goal. The choice to tax so as to discourage congestion implies a different automotive tax schedule than would taxation to maximize revenue.

Local automotive tax practices in LDC cities

Despite this seemingly excellent case for local taxation of urban motor vehicle ownership and use, urban governments in LDCs are not universally authorized to levy such charges. For instance, in Manila local authorities are expressly enjoined from levying any taxes or fees on motor vehicle registration. Where governments can impose taxes on motor vehicles or fuel consumption, they generally have not made a major effort to tap this revenue source at anything like its full potential. Comparative studies have shown that it is rare for automotive taxes to contribute more than 10 percent of total local revenue (Jakarta and Guatemala City are exceptions),[2] or even more than 10 percent of total local tax revenue (Tehran, Valencia, and Seoul).

2. A third city, not shown in Table 2, where automotive taxes apparently play a major role is Cairo. There they have contributed as much as 27 percent of local revenues in recent years.

However, especially the example of Jakarta underlines that automotive taxation, if turned over to local authorities and if given sufficient attention, can make a major contribution to local revenues even in an environment not otherwise outstanding in fiscal or administrative achievement (Linn, Smith, and Wignjowijoto, 1976). Thus, while in all cities for which detailed revenue and expenditure data could be assembled, the expenditures on urban roadways by far exceeded revenues from automotive taxes, in Jakarta the reverse held true, with motor vehicle tax revenues exceeding road-related expenditures by 120 percent (Table 2). Although there is no presumption that on economic grounds total municipal expenditures on the urban road network should equal the revenues collected from road users through automotive taxes, the general revenue shortages of local urban authorities in LDCs, which in part are due to an insufficient use of local automotive taxes, lead to a generally poor record on urban road investment and maintenance.

The practices in selected developing countries and cities—as reported in Bahl and Linn (forthcoming)—reveal that local automotive taxation consists of a very heterogeneous set of levies. In most cities where local authorities are permitted to levy automotive taxes at all, this takes the form of annual license taxes levied on all motor vehicles whose owners reside in the particular taxing jurisdiction. In some cities, a one-time tax is levied at the registration of a motor vehicle. In two cities, a local fuel tax was imposed by local governments. Finally, only in Singapore has an effort been made to apply restrictive licenses according to time and area of road usage within the city. Singapore also appears to be the only city in this sample where parking fees have been introduced and collected at more than a nominal level. Tolls on urban roads are not widely used.

The unrestricted local license taxes fall into three major categories: In Guatemala City, Ahmedabad, and Honduran municipalities, flat annual taxes are levied, differentiating only by type of vehicle. In Colombian and Korean cities and in Bombay, the tax varies not only with type of vehicle, but also according to weight. In Jakarta and in the South Korean cities, the tax varies according to type of vehicle and cylinder size. In addition to these three basic types of annual license taxes, there are special features in a number of cities: In the Republic of Korea, the local license tax is lower for business than for nonbusiness use, and for large cars the tax varies with axle length. In

TABLE 2. Revenues from local automotive taxes as a percentage of expenditures on urban roads: selected cities

City	Percentage
Ahmedabad	19.2
Bombay	19.0
Cartagena	7.2
Jakarta	220.2
Kingston	0.0
Manila	0.0
Seoul	36.2
Tunis	0.2

NOTE: These data are for various years between 1970 and 1973.
SOURCE: Bahl and Linn (forthcoming).

Bombay, higher taxes apply to vehicles not equipped with pneumatic tires. In Bogotá, the license tax declines with the age of the vehicle. Finally, in Colombian and South Korean municipalities, buses are charged according to the number of seats.

In contrast to annual license taxes, registration fees and transfer taxes are levied whenever the title to the motor vehicle changes hands (Bogotá, Cartagena, Jakarta), or only once at the time of initial registration (Tehran). In the Colombian cities, the registration fee appears to be nominal (less than US $1) and is presumably intended only to reflect the administrative cost of registration. (The illustrative data reported here and below are for the mid-1970s and taken from Linn, 1980a.) In Jakarta and Tehran, however, the registration "fees" are clearly in the nature of taxes, since they amount to a sizable proportion of vehicle value in Jakarta (10 percent for initial title transfer and 5 percent for any subsequent transfer) and to a flat charge of approximately US $44 for the initial registration of cars, taxis, and buses in Tehran (half that amount for trucks).

In those cities where local fuel taxes apply, they are usually levied on a specific basis–US $0.42 in Singapore, US $0.02 in Guatemala City, and a nominal US $0.0016 in Bogotá–and generally apply only to gasoline. The case of Singapore is exceptional since the fuel tax is a combination of a local and national tax, but it is of interest that

Singapore had one of the highest national gasoline tax rates in a sample of 48 LDCs surveyed by Smith. In the Philippines, cities and municipalities could impose a tax on gasoline up to 25 percent of the national gasoline tax up till 1974. In the Manila Metropolitan area, different percentage rates applied in the various local jurisdictions, varying from 0 to 25 percent of the national tax.

The case of Singapore is, however, even more exceptional since it is the first city in the world (that we know of) that has made a significant effort to restrain central city congestion by the application of area- and time-specific licenses and parking charges. The scheme was initiated in June 1975 and was monitored extensively by local officials and World Bank staff (Watson and Holland, 1978). In essence it consists of prescribing a restricted zone in the city which is defined to include the most congested central business districts, covering 62 hectares and having 22 entry points. Between 7:30 and 10:15 A.M. entry into this restricted zone by private automobile is permitted only if the vehicle exhibits a license which is sold at US $26 a month or US $1.30 a day. Buses, commercial vehicles, motorcycles, and car pools (i.e., cars carrying four persons or more) are exempt. This scheme was supplemented by a drastic increase in public and commercial parking fees. In addition, fringe parking lots were opened up with park-and-ride schemes to offer motorists an alternative form of transportation.

Objectives and yield potential

Automotive taxes may serve multiple objectives, and there are several tax instruments that might be used to emphasize one objective over another. The simple cross-tabulation in Table 3 is suggestive of the possibilities and underlines the need for a coordinated approach to developing an integrated automotive tax structure. First, efficiency and revenue-raising goals may overlap; for example, if the price elasticity is known to be quite low, the primary objective of fuel taxes will be to increase revenues. Second, the central government may have yet other objectives in taxing automobiles, for example, to channel private savings into more socially productive investments, to reduce imports in order to address balance-of-payments problems, etc. Third, each of these instruments can and has taken on many forms; for example, fuel taxes may vary by location or vehicle type depending on the efficiency versus the revenue objective of the local government.

TABLE 3. Objectives of automotive taxation

Objective of taxation	Types of taxation							
	Direct taxes on ownership				Indirect taxes on use			
	Import duties[a]	Sales tax[a,b]	Registration fee	Transfer tax	Fuel	Toll, area license	Sales tax on tires, parts	Parking fees
Reduce road use, congestion, pollution; or charge road user for social costs					X	X		X
General revenue instrument	X	X	X	X				
Instrument of energy policy			X		X			
Income redistribution	X	X						
Restrict automobile ownership	X	X	X				X	

a. Central government

b. Including excise on domestic production.

One view is that the efficiency goal is the primary criterion for evaluating the success of automotive taxation. The efficiency effect of automotive taxes depends on how far they are able to approximate the marginal costs imposed by the use of the motor vehicle. This marginal cost includes the variable maintenance and pollution costs and the marginal social costs of congestion, that is, the increased operating cost, time losses, noise, foul air, etc., imposed on society by the additional vehicle on the road. If automotive taxes are imposed to exactly equal these marginal costs of vehicle operation, then they will produce an optimal efficiency of road use. If, on the other hand, these taxes exceed or fall short of marginal social cost, then road use will be inefficiently restricted or expanded, provided only that the price elasticity of demand for road space is greater than zero. Obviously these marginal costs cannot be exactly measured, but they can be closely enough approximated to generate a set of tax rules or guidelines.

Even so, few would believe that automotive taxes are perfect benefit charges, and one might be left to consider pure fiscal impacts. Increased automobile use will increase $\hat{E}$ and E in equations (1) and (2) above and will raise the size of the public service deficit ($\hat{D}$). Our question is: What is its potential for also increasing revenues and thereby offsetting this deficit?

The revenue performance of various types of automotive taxes has been mixed.

Local government taxes on motor fuels have excellent revenue potential, though they are usually levied at inordinately low rates. Linn has estimated, for example, that in Guatemala City an increase of the fuel tax from the existing rate of 2 US cents to 10 US cents in 1971 would have made fuel tax the most productive local tax and would have increased local tax revenues by some 50 percent. In Bogotá, the increase of the local gasoline tax from 0.16 US cents to 10 US cents would also have made the gasoline tax the most important local tax, with revenues almost double those of the property tax, and would have raised local tax revenues by more than 100 percent. The revenue elasticity of this tax depends crucially on whether it is levied at a specific rate or *ad valorem*. In the former case, tax revenues are likely to be quite inelastic, especially where inflation rapidly erodes the real value of the specific tax,[3] and when gasoline consumption is not

3. In Bogotá, per capita gasoline tax collections in constant prices declined between 1961 and 1972.

growing. In the latter case, however, tax revenues are likely to be quite buoyant, given the rising price of fuel. What is more, fuel tax revenues are likely to be quite stable, since motor vehicle use is not likely to vary much with short-term fluctuations in economic activity.

Besides the excellent revenue potential, fuel taxes have the great advantage of being relatively easy to administer, especially where the production and wholesale distribution of fuel is in the hands of a government-owned enterprise, as is the case in many developing countries. *Ad valorem* taxes are more difficult to administer and police than specific levies because of the possibility of evasion, especially at the retail level. This explains the general preference for specific fuel taxes in LDCs at the national and local level. There is finally the issue of whether higher-level governments are likely to be willing to let local authorities share in such an important revenue source The fact that few local governments actually levy a fuel tax may lead to some skepticism on this score. The example of Jakarta confirms this: In 1969, the local authorities imposed a local fuel tax at a rate of approximately one US cent per gallon. Other local governments in Indonesia followed suit, but within a year the national government had taken over the tax (Linn, 1977).

Local government sales and transfer taxes on motor vehicles would increase the price of the vehicle and the cost to the purchaser. This would have three effects. First, it may restrict ownership to the extent the demand for automobiles is price elastic. In this way, road use might be indirectly limited. Second, the higher price of the car would increase its annual cost to the purchaser and its use to the extent depreciation is linked to use. Third, it would generate increased local government revenues. The uncertainty is the magnitude of these effects.

On the revenue side, an important consideration is that it is likely to be quite difficult to administer higher local sales taxes on automobiles in urban areas, since the potential for evasion is considerable. Automobiles may be purchased in jurisdictions with lower tax rates, or out-of-town addresses may be given if the tax is linked to the residence of the purchaser. The incentive for evasion is likely to pose a much greater problem in the case of sales taxes than for annual license taxes. This may explain why local governments have generally been given access to license taxes, but only in rare cases to sales taxes on automobiles. An exception is Jakarta (Linn, Smith, and Wignjowijoto,

1976). Both sales and license taxes are levied by the local government, and approximately equal revenues were derived during the fiscal year 1972/73. The average transfer tax per new motor vehicle was calculated to equal US $89. For the annual motor vehicle license tax, the average tax per vehicle registered in Jakarta was US $16. In view of the relatively high tax rate of the transfer tax (10 percent of value for a new vehicle, 5 percent for a used vehicle), the average tax rate is low, reflecting in large part the high degree of evasion that occurs. In fact, the well-known widespread evasion of this tax was one of the major reasons given by local officials for the decision to decrease the legal tax rate in 1971 (from rates of 20 and 10 percent, respectively). In contrast, the administration of the annual license tax appears to work effectively, and evasion does not seem to be a major problem.

The revenue potential of a local automobile sales or transfer tax could be substantial; for example, in Jakarta the transfer tax accounted for 22 percent of all locally raised revenues, with a respectable income elasticity of about 1.5.

In general, therefore, one would conclude that motor vehicle sales taxes are not on a par with fuel taxes or annual license taxes as a local government revenue source. Both of the latter have the advantage of being more easily administered, permitting a greater degree of regional differentiation, and neither results in unfair windfall gains to current motor vehicle users.

Unrestricted annual license taxes are levied according to residence in the area, rather than according to use of the motor vehicle. This tax, therefore, does not affect the use of a vehicle once it has been purchased; however, the decision on whether or not to own a motor vehicle is affected by the license tax, since the annual cost of ownership will increase. This means that unrestricted license taxes may reduce automobile expenditure requirements in the public sector, but the more important fiscal effects are likely to come on the revenue side.

The revenue success with license taxes depends largely on how the tax is structured. As with the local fuel tax and the motor vehicle sales tax, the problem of evasion arises. In the case of the annual license tax, vehicle owners may escape the tax by registering these vehicles in low-tax jurisdictions. This limits the degree to which license taxes can differ, especially between adjoining jurisdictions. However, there is reason to believe that with vigorous enforcement and sizable penalties, some differentiation without major evasion is feasible. The example of

Jakarta tends to confirm this conclusion. Penalties of 100 percent of tax liabilities have been effectively applied in the case of attempted tax evasion, including confiscation of the vehicle where other means of enforcement have failed. In Bogotá, it is claimed that many of the city residents register their vehicles in surrounding jurisdictions. However, the main reason for this evasion does not appear to lie with higher license taxes in the city than in the rural areas, but rather with the long waiting times and the amount of red tape associated with obtaining the annual license in Bogotá.

In their effects on revenue performance, annual motor vehicle license taxes can make considerable contributions to locally raised revenues in LDC cities. In Jakarta, the motor vehicle license taxes accounted for approximately 25 percent of all local taxes during fiscal year 1972/73, and for 22 percent in Seoul during 1971. The level, as well as the buoyancy, of revenue depends very much on how the tax is administered. In Jakarta and Seoul, where administration was good and rates were regularly adjusted to allow for changes in the price level, not only was the level of revenues generated substantial, but also the buoyancy was found to be high. In Jakarta it amounted to about 1.5 and in Seoul to 1.2 (Linn, Smith, and Wignjowijoto, 1976; Bahl and Wasylenko, 1976). In Bogotá, per capita revenues collected from the motor vehicle license taxes declined if allowance is made for inflation, thus implying a low buoyancy, whereas in Cartagena vehicle tax revenues expanded rapidly in recent years and exhibited a buoyancy probably somewhere in the neighborhood of unity (Linn, 1975). In Bombay and Ahmedabad, revenues collected from the local motor vehicle taxation remained approximately constant in real per capita terms and thus showed a buoyancy probably less than unity.[4] The main lesson from these widely divergent revenue experiences is that the capacity of the motor vehicle license tax as a major revenue source for urban governments depends very much on how it is structured and how aggressively it is administered. The rapid growth in the base will ensure a certain amount of revenue growth, but evasion and inflation are likely to cut heavily into this growth potential where administra-

4. In Bombay, the problem resulted mainly from the failure to keep current records on automobile ownership and to detect delinquent taxpayers on the road. Therefore, collections lagged well below 40 percent of total tax liabilities during the late 1960s. See Bahl, 1971.

tion is poor and specific tax rates are not increased to keep pace with changing prices.

The taxes discussed above might all be viewed as potentially important revenue-raising instruments. The efficiency impact of these taxes is uncertain, and for relatively low tax rates, probably not of much importance. This is less true for the more pure congestion charges: area- and time-specific vehicle licenses, parking charges, and tolls. All of these are suited for local government administration.

Singapore is one, perhaps the only, example of a large city making use of unrestricted motor vehicle licensing. The costs of introducing the scheme were minimal. To quote Watson and Holland (1978:37): "Overall, the total cost was less than it would have cost to build two kilometers of 4-lane urban expressway." The revenue implications of the scheme, while not of great scope, are on balance favorable. Annual revenues net of operating costs amount to approximately US $2.4 million. Compared with revenues collected from other taxes on motor vehicles or from property taxation, these revenues are not substantial (approximately 1 percent of property taxes), but in any case the system does not constitute a net drain on the public purse and compared with other tax measures has a low ratio of administrative costs to revenues.

Parking fees and taxes have been suggested as the major alternative to charging motor vehicle operators directly for the use of congested urban streets, but they are rarely used to any significant degree. The parking tax would have two major components: taxing commercial and private parking facilities in congested central city areas (e.g., as is done in Singapore) and levying fees for on-street parking either through attendants (as in Jakarta) or through parking meters (as in Central American cities). The study by Bahl and Linn showed no case where these taxes yielded significant revenues. Indeed, in one case (Cali), newly constructed parking facilities are given a ten-year exemption from all municipal taxes.

One is hard-pressed to find examples of LDC cities where *tolls* are used as a means to control congestion or raise significant amounts of revenue. To the extent that tolls are levied at all in urban areas they affect the more uncongested, special-purpose expressways, such as the expressway to the airport in San Jose, Costa Rica, where the main goal of the charge is presumably to recover the capital costs from the users. Indeed, the dilemma with toll roads is that they are always inefficient:

in uncongested traffic, because they restrict traffic below the optimal use of the road; and in congested traffic, because they tend to worsen, rather than alleviate, congestion and are furthermore costly to administer.

OTHER URBAN TAXES

Apart from property and automobile taxes, local governments can and do use a large number of other taxes and licenses. While these alternative sources of revenue are not always easily administered or free from unwanted efficiency or equity effects, and while they tend not to be the more comprehensive income and consumption bases that local governments would prefer, they have the advantage of being available. They also offer local governments the advantage of capturing some of the income and consumption growth that is characteristic of urbanization.

Local governments in developing countries typically have one major nonproperty tax revenue source, usually some form of indirect tax on local trade or business activity; some form of automotive taxation; and a large number of "smaller" local taxes. Often the latter are quite large in number but add relatively little to total revenues.

Income taxes

There is more use of local income taxation in developing countries than one might expect. Bahl and Linn have described the practice in India, the Republic of Korea, Zaire, Zambia, Nigeria, and Guatemala. Botswana employs a local income tax, but such a tax was abolished in Kenya in 1972. Local income taxes may not capture the benefits of urban growth as fully as one might expect, for three reasons.

First, the law usually does not permit a pure income tax, that is, one that covers nonwage incomes. More commonly, local governments must rely on some combination of a poll (head) tax, a wage tax, and limited income tax sharing with higher authorities. The poll tax element is important in Guatemala City, where a specific tax is levied on all men (and women in public-sector employment), distinguishing only between three income groups. In Zambia, a similar system applies, except that there are seven income groups taxed at different rates. In Zaire, local authorities are permitted to levy what amounts to a local wage tax at approximately proportional rates and a specific tax on

traders and professionals, but only for those income earners who are exempt from the national income tax. The South Korean cities combine a head tax on heads of households (and on corporations) with a surtax on all tax liabilities of the national personal income tax, the corporate income tax, and the farmland tax. Nigerian cities, including Ibadan, have levied a local income tax on all taxpayers exempt from state income taxes, and the cities share in the state income tax. State law permits the local government in Calcutta to tax all professions, trades, and salaried persons. The point is that many of the fruits of urban growth are simply not included in the tax base.

Second, even where property and proprietorship income is taxable, the evidence shows that it is not taxed because of the difficulty of controlling evasion and underreporting. Presumably, this problem has moved at least the Zaire government to tax nonwage earnings at flat rates irrespective of the amount of income earned.

The third, and perhaps most important, limitation on the coverage of local income taxes in LDCs is simply the unwillingness of most central governments to give up any share of the income tax base.

To the extent that any generalizations are possible regarding this varied experience with local income t es, one might conclude that all local income tax in LDCs can hope to achieve is to tax wage earnings in the modern sector of the urban economy.

There is little evidence on the actual revenue performance of local government income taxes in developing countries. From the study by Bahl and Linn, it may be observed that the performance of the poll tax variety of income tax has been dismal, while South Korea's broader-based levy has accounted for nearly one-tenth of total local government revenues.

General sales taxes

Few local governments in LDCs are permitted to levy broad-based sales taxes. Typically, this potentially important source of revenue is reserved for higher-level governments. Bahl and Linn's survey could turn up only Bogotá, Managua, and Rio de Janiero as deriving (at one time or another) significant amounts of revenue from broad-based local sales taxes. However, the sizable revenue yield in these three cities (69 percent of total tax revenues in Managua and 89 percent in Rio) attests to the considerable potential of local sales taxes.

Local taxes on industry, commerce, and professions

Taxes on industry, commerce, and professions are a common source of local government revenue. In many Latin American cities, this form of taxation contributes sizable proportions of total local tax revenue. For example, the local taxes on industry, commerce, and services (in the mid-1970s) accounted for 84 percent of local taxes in San Salvador, 67 percent in Valencia, and for as much as 73 percent in La Paz. In the Philippines, about 40 percent of locally raised revenues are from the local business tax.

The nature of this local tax varies widely among countries and even among cities within a country. In Colombia, for instance, five types of local taxes carry the title of "industry and commerce tax." A turnover tax is used in Bogotá, Medellín, Armenia, and Montería. A tax on the value of gross business assets is levied in Cali, Barranquilla, and Cartagena, among others. Some Colombian cities levy a tax on the value of fixed assets of the firm located in the taxing jurisdiction (e.g., Popayán, Neiva), others on the rental value of the business establishment (e.g., Cúcuta). Finally, most smaller municipalities in Colombia levy the tax in the form of specific levies by type of enterprise. Thus, while in all municipalities this tax carries the same name, it actually represents a sales tax in some cities, a tax on business capital in others, an annual value tax on business real estate in yet others, and in most small municipalities simply a business license tax.

The revenue yield potential of business taxes can be substantial. With urbanization, the number and size of business establishments increase and the taxable base grows. Even though the base may be inadequately assessed, the tax yield can grow rapidly. An analysis of the Philippine business license tax shows that even under quite poor assessment and collection practices, the income elasticity of the tax yield often has been greater than unity (Bahl and Miller, 1982: Chapter 3).

Octroi

In many cities in India and Pakistan, octroi is a dominant revenue source. The base of the octroi is the value, the weight, or the number of items entering a local jurisdiction by road, railway, sea, or air. Obviously the base will expand rapidly with local economic growth; hence despite its many flaws, the octroi is a productive revenue source.

In fact, in many Indian and Pakistani cities, octroi dominates the revenue structure, for example, in Ahmedabad, Karachi, and Gujranwala. In Karnataka State (India), it accounted in 1974 for 55 percent of tax revenues of all urban local authorities, as opposed to 33 percent for the property tax (Rao and Rao, 1977:26–27). Moreover, this importance appears to be increasing, since the octroi has also been one of the most buoyant sources of local revenue (e.g., in Ahmedabad, Bombay, Karachi, and Karnataka). This buoyancy is explained in part by the underlying automatic growth in the base as intercity trade expands in value and volume, but in part also it is due to the active efforts by local authorities to increase revenues by higher and restructured octroi tax rates. For example, Ahmedabad and Bombay carried out extensive rate structure reforms in the mid-1960s which have significantly increased the level and rate of increase of this tax (Bahl, 1971; Bahl and Wasylenko, 1976; Bougeon-Maassen, 1976). Finally, in Calcutta where the octroi was more recently adopted, it was introduced by the state government for the entire metropolitan area, with its revenues to be shared among the various local bodies and the Calcutta Metropolitan Development Authority.

Elsewhere, to the extent that they ever existed, taxes on intercity trade have become virtually extinct. For instance, in Iran a local tax equivalent to the octroi ("gate tax") was abolished in 1962 (Bahl and Linn, Chapter 6). In Cali, Colombia, a local statute prescribes a tax on all merchandise imported from abroad with the final destination of Cali. The rate is Col $0.02 (approximately 0.06 US cents) per kilogram. However, due to administrative difficulties and lack of effort in collection, this tax only contributed 0.6 percent of local government revenue in 1975.

Local sumptuary and entertainment taxes

If "bright lights" are a cause of rural-to-urban migration, they also offer some potential for urban government taxation. Taxes on beer, liquor, and tobacco—usually referred to as sumptuary taxes—are widely in use in LDCs, and in some countries local authorities are entitled to levy such taxes or to share in the proceeds of sumptuary taxes imposed by higher-level government. For example, in Zambian cities, the local tax on beer consumption is by far the most important source of local tax revenues; in Guatemala City, local taxes on liquor, beer,

and cigarettes contributed 7.6 percent of local tax revenues (1971); in San Salvador, a local tax on liquor produced 15 percent of tax revenues (1973); in La Paz, a local beer tax contributed 7.1 percent (1975). In Bogotá, the national tax on beer consumption, of which 40 percent is shared on a derivation principle with departmental (state) governments and the city government of Bogotá, raised revenues that in 1972 amounted to 27 percent of all local government revenues (excluding local autonomous agencies) and was the largest single revenue source of the local authority (excluding all local autonomous agencies). The local government in Bogotá also derived revenues from a local tax on foreign cigarettes and a shared tax on all tobacco products.

In the long run, the income elasticity of sumptuary taxes is likely to be quite low unless real tax rates are continuously increased because of the low income elasticity of liquor and cigarette consumption. The Bogotá beer tax, which probably is one of the success stories in revenue performance, actually maintained its share in overall city government revenues in the ten-year period from 1963 to 1972. However, this was during a time when the most important other source of local revenue, the property tax, remained quite stagnant in real terms, thus depressing the overall growth of revenues in Bogotá.

It is common in many LDCs for local government, particularly in the larger cities, to levy taxes on various forms of entertainment. Among these are taxes on restaurants and hotels; on theaters, movies, and other types of public entertainment events; and on gambling. Revenues derived from lotteries operated by local governments also may be counted as an entertainment tax. Bahl and Linn's survey has shown that most cities in LDCs derive some revenues from entertainment taxes.

There are problems with respect to the revenue performance and administration of entertainment taxes. Assessment and collection can be difficult, as observed for instance in the case of Seoul or Jakarta. Revenues are generally not substantial, although their buoyancy can be considerable. For instance, entertainment tax revenues in Seoul and Jakarta had a buoyancy greater than unity, and in many of the other cities revenues from these taxes were among the most rapidly growing of all local taxes.

CONCLUSION

Three tax bases are particularly appropriate for financing urban growth in developing countries: real property, automobiles, and consumption. All tend to grow at least as rapidly as population or income and could, therefore, support the increased urban expenditures that support economic growth. In all cases, appropriate tax design could minimize allocative inefficiencies and set the stage for effective administration. For the property tax, this need not necessarily be at the expense of revenue. With respect to automobile taxation, there is clearly a revenue-allocation effect tradeoff.

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A false fertility transition: the case of American blacks

Paul Wright
and Peter Pirie

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PREFACE

This paper was begun when we were both at the East-West Population Institute, East-West Center, and the Department of Geography, University of Hawaii at Manoa. Since then Paul Wright has joined the Department of Earth Sciences at the University of California at Riverside. The East-West Population Institute has continued to support the work to completion. An earlier version of the paper was presented at the Annual Meeting of the Association of American Geographers, New York, in 1976.

Two anonymous reviewers gave us helpful advice, which improved the final product. We remain responsible for the advice we did not take and for the work as a whole. Sandra Ward edited the paper with skill and care, and we are grateful to her, to Lois Bender, who did the typesetting, and to Gregory Chu, who did the cartography. Alice Harris and her staff of the institute's Resource Materials Collection were consistently helpful.

ABSTRACT The decline in U.S. black fertility after the Civil War to its lowest level about the year 1936 does not fit the typical demographic transition pattern. Black life expectancy did not begin to increase perceptibly until the 1920s, and the economic and social environment of blacks, particularly those in the rural south, was unhelpful in lowering fertility.

This paper attributes much of the fertility decline to "involuntary infertility" related to sexually transmitted diseases, particularly gonorrhea and syphilis, and their sequelae, principally pelvic inflammatory disease leading to subfecundity and infertility, together with pregnancy wastage through involuntary abortion and stillbirth.

The cumulative increase in the incidence of venereal diseases among U.S. blacks is traced from the days of slavery through Emancipation to World Wars I and II. The possibility that blacks adopted contraception on a progressively large scale before the 1930s is examined and largely dismissed.

Circumstantial and historical evidence makes a compelling case for venereal diseases having a strong effect on U.S. black fertility, but it proved feasible to establish a stronger link between the two by using geographical techniques. Within the six-state region of the southeastern United States (South Carolina, Georgia, Florida, Mississippi, Alabama, and Louisiana) the incidence of syphilis among black males, as discovered by the Selective Service in 1940–41, is related to the areal pattern of black fertility by county in the same year. It proved possible to correlate the two variables at a fairly high level and to find explanations for the variations related to differential social and economic conditions within the region.

After World War II, U.S. black fertility rose dramatically. The rise was related to the prevalence of antibiotic treatment for venereal diseases, allowing many blacks to realize a long-thwarted desire for larger families. A slight increase in fertility had occurred after about 1936, which was related to improved general health, the use of sulpha drugs, and more vigorous action by federal and state authorities against venereal disease. The pattern of fertility in 1960 showed substantial increases in virtually all counties in the six-state region and more particularly in those where fertility had been most depressed. Using several methods, we estimate the physiological impact of the venereal disease-related infertility as having accounted for about 56 percent of the total fertility decline before 1936. The remaining 44 percent would be distributed among such causes as inadequate statistical data, which we see as weakening our case; other pathologies, such as tuberculosis, pellagra, and malaria; and deliberate family limitation, concentrated first among the northern urban blacks, but having a progressively greater effect on all blacks during the period.

After 1957, by which year black fertility was at a level not achieved since 1910, fertility again began to decline. This decline we see as largely

deliberate, owing to the increasing adoption of family planning methods and the initiation of the final phase of blacks' true demographic transition. The effects of the prevalence of venereal disease are now difficult to gauge, but it must have blighted hundreds of thousands of black families. Instead of 26 million, the number of blacks recorded by the U.S. census in 1980, the black population, without the "involuntary infertility effect," would probably have been at least 45 million. Although the magnitude of the problem has been greatly reduced, it has still not evaporated; nearly one million cases of pelvic inflamatory diseases still occur every year, the venereal diseases are having a troubling resurgence, and blacks in the southeastern states are still disproportionately affected.

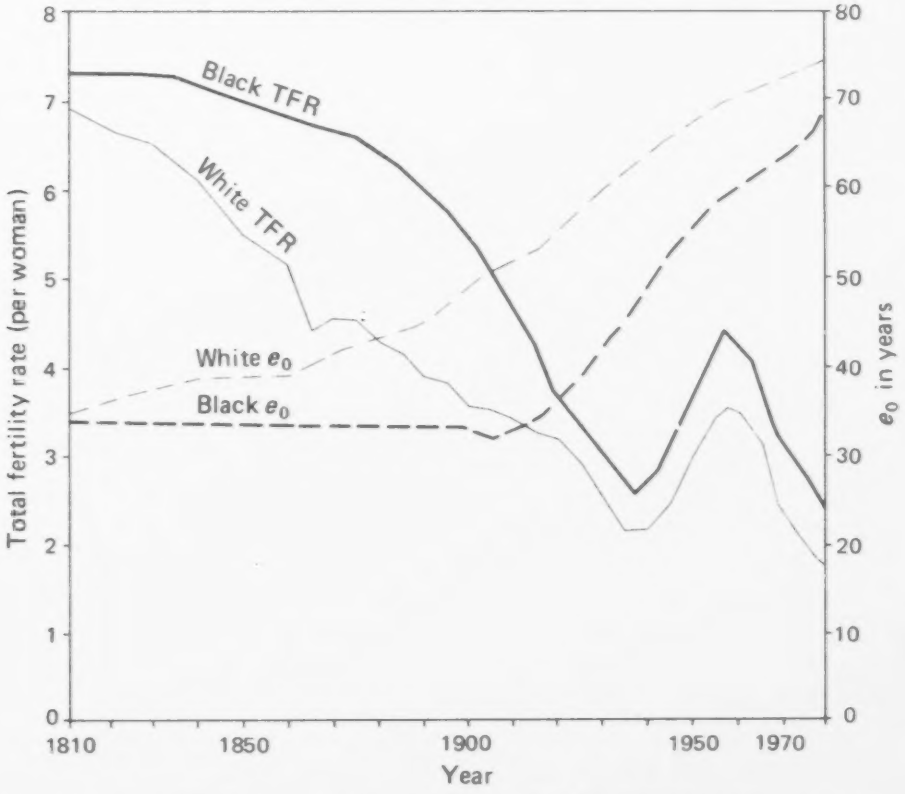
A sustained fertility decline among the black population of the United States, beginning after the Civil War and ending about 1936, is now well established (e.g., Eblen, 1974; Coale and Rives, 1973). During the late 1930s, this trend was reversed and black fertility reached a peak in 1957 of over 60 percent above the 1936 low. By 1960, another decline, which is still continuing, had become apparent (Figure 1).

The trend in black mortality, expressed in Figure 1 as expectation of life at birth (e_0), is not so well established; but it appears to have remained at a relatively constant level (about 30–34 years) until after World War I, when some improvement became apparent. Recent levels (1981) are close to 70 years, still about four years below that for the white population. For the black population mortality remained virtually unaffected by improvements in medical care or environmental sanitation for over a century after the white population had begun to benefit significantly from modern health development. From a level similar to that of the black population around 1810, the white population achieved an expectation of life of about 40 years in 1865 and about 52 years in 1910. Another implication of the curve showing expectation of life for blacks is that, before it achieved any significant upward movement, over half of the total decline in black fertility, as shown by a drop in the total fertility rate (TFR) from about 7.0 per woman prior to 1865 to about 4.75 in 1910, had already been accomplished.

BLACK FERTILITY TRANSITION: DELIBERATE OR INVOLUNTARY?

These characteristics, at odds with the traditional demographic transition model, are both unexpected and unusual. According to

FIGURE 1. Trends in total fertility rates (TFRs) and expectation of life at birth (e_0) for the white and black populations of the United States, 1810–1979



SOURCES: Eblen (1974); Coale and Rives (1973); Demeny and Gingrich (1967); Coale and Zelnick (1963); U.S. Bureau of the Census (1982).

transition theory, declines in fertility should postdate, usually by several decades, the initiation of mortality decline. The mystery is deepened further by the absence of any discernible parallel improvement for most blacks in conditions usually associated with voluntary fertility limitation. Instead, in the two decades between 1937 and 1957, during which black fertility rose dramatically, their living standards began to benefit from rapidly improving economic conditions related to the New Deal and World War II, together with the mounting assertion of black civil rights and the rising conscience of white Americans.

A complicating factor in the interpretation of the causes of this fertility trend among U.S. blacks is the relationship the trend shows with that of the white population. Although consistently higher, the black TFR declined in tandem with the white after 1870 and since 1915 has generally tracked within less than 1.0 difference with almost uncanny precision. The temptation to assume that the two populations are responding to the same set of causes is great. "[Data] . . . suggest the demographic transition as a national process affecting both the majority population of largely European origin and the minority of largely African origin, though with difference in timing" (I. Taeuber and C. Taeuber, 1971: 379). Somewhat more cautiously, Coale and Rives (1973: 30–31) have stated:

> A puzzling feature of the time pattern of black fertility is the beginning of a very steep and sustained decline as early as 1880. The black population in the United States remained almost entirely Southern and rural until 1900. To a high degree it was substantially less urban than the white population in 1930. . . . Moreover our estimates show little change in mortality between 1880 and 1900. . . . In short the black population in the U.S. does not appear to be a population that was ready for demographic transition beginning in the 1880's. One interpretation of the decline is that it represents a diffusion of attitudes and practices from the white population in which the decline in fertility had begun much earlier and had proceeded far by 1880.

It was to test this process, using a diffusion model on fertility changes, that our study was initiated.[1] We began by mapping the child-woman ratios (CWR) by county in six southeastern states: Alabama, Florida, Georgia, Louisiana, Mississippi, and South Carolina. The geographical pattern of implied fertility shown by the census data for 1930 and 1940 was not one that could have been expected on the basis of the demographic transition.

By 1960, fertility levels, although much higher overall than in the earlier censuses, did vary areally in a more traditionally explicable pattern. These spatial patterns for 1930, 1940, and 1960 are shown and discussed in detail later in the text.

The peculiarities of the 1930 and 1940 fertility distributions, particularly the occurrence of extremely low fertility among blacks in many of the least developed and most poverty-stricken counties, led

1. As the model is not pertinent to the study as it evolved, we do not discuss it in this paper. Interested readers are referred to Demko and Casetti (1970).

us to invoke another model, that involving progressive involuntary subfecundity related to disease, as a major factor in the decline.

The possibility of disease-induced subfecundity in relation to the U.S. black population has been raised before, notably by Reynolds Farley in his work *Growth of the Black Population* (1970: 222–35). Farley concludes:

> As far as we can detect, this decrease [in black fertility] was chiefly brought about, not by changes in marital patterns or the increased use of contraceptives, but by alterations in health conditions which were unfavorable to fecundity (p. 243).

Farley examined the role of venereal diseases and pellagra in some detail before coming to this conclusion. In this paper we focus on the contribution of sexually transmitted disease (STD) to this situation, without necessarily discounting the possibility that other medical problems, an increasing use of birth control, changes in marital stability, mate exposure, and family structure also contributed to the decline.

The sexually transmitted diseases involved are principally syphilis and gonorrhea. The role of gonorrhea in causing pelvic inflammatory disease (PID) has been well established; but other microorganisms, notably *chlamydia trachomatis* and *mycoplasma hominis*, have also been implicated (St. John and Brown, 1980). In the literature of the day, between the 1880s and the late 1930s, only syphilis and gonorrhea are identified as widespread venereal diseases among blacks. Chancroid, which does not appear to affect fecundity, was also referred to occasionally. Salpingitis, inflammation of the fallopian tubes, is attributed to gonorrhea in virtually all cases. The possibility of other agents such as chlamydial infections or other known causes such as induced abortion, various gynecological procedures, and of course IUD insertion, is not raised. Nor did we find the suggestion in this literature of the probability that one of the consequences of salpingitis is increased risk of ectopic pregnancy, now known to be a factor in fetal wastage. It seems that several of these factors have increased in their frequency in recent decades or have only lately been recognized (Westrom, 1980). Since none of these agents could be successfully treated during the period in which most of the fertility decline occurred, it is not of great importance if agents other than gonorrhea are involved in salpingitis if they too are sexually transmitted. The outcomes, subfecundity and increased sterility, are the same and their incidence is likely to be correlated.